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INDUSTRIAL CONTACT REPORT

Date: June 6th, 1972.

Visit to: Ministry for Electrical Engineering Industries
of the U.S.S.R.,
19 Prospekt Kalinina, Moscow.

Present:

M.M. Morozov	}	Ministry for Electr.Eng. Industries
D.S. Varshavskij		
N.V. Pereselentev		
Liudmila P. Strelchenya		
Mr. J. Geller - M.Golodetz (Overseas)Ltd., London		
Mr. P. Ekman	}	Monsanto Europe S.A.
Mr. R. Thompson		
Mr. C.R. Coleman - M.C.L.		

Subject Discussed: Aroclor for capacitors.

Summary and Conclusions

Morozov said there were no complaints about Aroclor. Varshavskij raised a number of technical points for discussion and reply. There may be an order for 7 tonnes of Aroclor 1242 E1 and 2 tonnes of Aroclor 1242 + EAQ later this year. They have a requirement for an impregnant suitable for temperatures as low as -70°C.

Samples of our epoxide additive and 10 litres of Aroclor 1242 E1 were requested.

Varshavskij said that the writer had been invited to attend a conference in Bulgaria, 20 - 23.10.72.

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DETAILS

Morozov opened the meeting by saying that they had no complaints about the Aroclor that they had purchased. (This broke the ice!)

1. The first topic for discussion concerned additives for Aroclor. They continued to hold the impression that Monsanto was unable to supply Aroclor containing an epoxy additive, whereas our competitors had such products available. The writer corrected this false impression and distributed copies of our brochure on Aroclor 1242 El.

The writer pointed out that MCS 748, a sample of which had been supplied at the time of his last visit, had not been progressed since it was thought to be too difficult to control effectively under industrial conditions. The new product, Aroclor 1424 El overcame the previous difficulties.

They asked about U.K. capacitor manufacturers' reactions to this new product. In reply, the writer told them that no interest had been shown by capacitor manufacturers in the U.K., and the product had been developed in response to demands from Italian and Spanish manufacturers. Trials had taken place and no complaints had been received. They said this was a frank answer.

Varshavskij asked for a sample of at least 10 litres of Aroclor 1242 El and, in addition, a sample of the additive itself.

After some discussion amongst themselves, they decided that they may want to order later this year 7 tonnes of Aroclor 1242 El. In addition, they may want, for d.c. capacitors, 2 tonnes of Aroclor 1242 + EAQ. Golodetz will advise about the commercial conditions, for example whether they can purchase these special grades in place of the straight Aroclor 1242 already ordered.

Varshavskij asked about the conditions for long-term ageing tests on capacitors impregnated with askarel containing epoxide. The writer said he would answer by mail.

2. Varshavskij asked if we could produce an impregnant for use in capacitors for temperatures as low as -55 to -70°C. He thought that we might produce such for use in Canada. (Haggart to advise if available). The writer expressed the view that a product for use below -45°C was unlikely to be immediately available.

3. Morozov asked about the health regulations for using Aroclor. He said that these were referred to on the drums, but they hadn't got a copy of them.

4. Varshavskij asked for details of the solubility of various gases in Aroclor. The writer will answer by mail.

5. Pereselentev asked if we could let them have a measuring test cell so that they could carry out tests in the same way as us. It was pointed out that we had sent them an M.C.L. cell previously (17.7.67). However, we had now ceased to use this type of cell for production control purposes. Instead the Balsbaugh cell was used according to the method described by Dr. Munch.

They discussed this amongst themselves and recalled receiving the M.C.L. cell.

6. Varshavskij described a distillation of Aroclor in which 3 fractions of different BP's were collected and asked for comments. The writer pointed out that it was possible to collect more than 3 fractions and gave them a photocopy of a chromatogram obtained by the capillary column method. (Figure 1 in Vodden and Lidgett's paper).

7. Varshavskij talked about the decomposition of Aroclor at elevated temperatures by radical growth. He asked if we had tried the use of additives to prevent this. The writer pointed out that, at the temperatures normally encountered in capacitors, the rate of decomposition was too low to be detected. Details of experiments in support of this claim will be supplied. These showed that only in the presence of copper and oxygen at a temperature of 200°C was decomposition indicated by an increase in tangent delta.

8. The writer was asked if he wished to put any questions to those present. He said that, although Mr. M.I. Shakhnovich was not present at today's meeting, he had noticed recent publications advocating the use of hexachloro-butadiene in transformer askarels. Although this compound may be very suitable from the applicational viewpoint, its toxicological properties, as described in Hooker's data sheets (photocopy supplied) seemed to preclude its application in the transformer industry on an industrial scale.

They did not seem to know about these undesirable properties. Morozov said that they were testing it and had not yet reached a conclusion.

9. There was a brief discussion amongst themselves on polypropylene film and Aroclor. They asked what effect Aroclor had on polypropylene film. The writer expressed the view that the manufacturers of polypropylene film had adapted their products to make them suitable for use with Aroclor by reducing the amount of extractable ionizable impurities in it. They considered that the question of the effect of Aroclor on polypropylene film was more important. There was insufficient time to pursue this topic.

10. Aroclor 1016 and the reasons for its introduction were briefly mentioned. They had no interest in this product.

11. Means of bulk delivery and the superior quality that can be obtained (as recognised in IEC proposed standards) were briefly mentioned. They showed a slight interest, but were resigned to continue with drums.

12. Finally, Varshavskij said that the writer had been invited to attend a conference in Bulgaria 20-22.10.72. Our competitors had also been invited and had accepted. 30 countries will be represented. We said that this invitation had not been received and Varshavskij agreed to investigate.

(Since received and declined because its subjects concentrated on cables. Another conference, due to be held next year, will specialize on capacitors.)

13. Morozov said that they do not expect to buy any more Aroclor this year.

The writer thanked the hosts for re-arranging their schedules so that the meeting could take place on that particular day.

This meeting was somewhat more hurried than on previous occasions because they had another meeting following ours.

C.R. Coleman

C.R. COLEMAN

CRC/HH
22.9.72

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